

IN THE CLAIMS

In this amendment, claims 2, 10, 12-23, 25-27, 29-31 and 33 are canceled. Claims 34-40 are added. The status of all claims is provided below.

1. (original) A catalytic system comprising a tethered catalyst composition or a tethered chiral auxiliary disposed in a microchannel.
2. (canceled)
3. (original) The catalytic system of claim 1 wherein the system comprises a tethered catalyst composition, and the tethered catalyst composition defines at least one wall of a bulk flow path in the microchannel.
4. (original) The catalytic system of claim 3, wherein at least one heat transfer microchannel is adjacent to at least one wall of the microchannel.
5. (original) The catalytic system of claim 1 wherein said tethered catalyst composition or tethered chiral auxiliary is provided as, or part of, a porous insert.
6. (original) The catalytic system of claim 5, wherein said porous insert is adjacent at least one wall of the microchannel, and at least one heat transfer microchannel is adjacent said at least one wall of a microchannel.
7. (original) The catalytic system of claim 1, wherein said tethered catalyst composition or tethered chiral auxiliary comprises a solid support selected from the group consisting of: solid inorganic oxide, carbon, polymer, silica, alumina, clay, zeolite and mesoporous solid.

8. (original) The catalytic system of claim 1, wherein the system comprises a tethered catalyst composition in which a tether comprises at least a three atom chain that connects a metal center with a surface oxygen.

9. (original) The catalytic system of claim 8, wherein the tethered catalyst composition comprises one or more member selected from the group consisting of metal, metal coordination complex, organometallic complex, oxidant, reductant, acid, and base.

10. (canceled)

11. (original) The system of claim 1 further comprising a micromixer positioned to mix reactants prior to passage into the microchannel.

12-23. (canceled)

24. (original) The catalytic system of claim 1 wherein the microchannel comprises at least one wall and a tethered catalyst or a tethered chiral auxiliary is coated on the wall of the microchannel.

25-27. (canceled)

28. (original) The system of claim 1 wherein the microchannel comprises a chiral auxiliary.

29-31. (canceled)

32. (original) The catalytic system of claim 1, wherein the system comprises a tethered catalyst composition comprises a dendritic catalyst.

33. (canceled)

34. (new) The catalytic system of claim 1 wherein the microchannel comprises a minimum dimension of greater than 1 μm and a length greater than 1 cm.

35. (new) The catalytic system of claim 34, comprising at least one heat transfer microchannel that is adjacent to at least one wall of the microchannel.

36. (new) The catalytic system of claim 35 wherein the at least one wall of the microchannel is comprised of an iron based alloy.

36. (new) The catalytic system of claim 34 comprising at least 10 of the microchannels that comprise a tethered catalyst composition or a tethered chiral auxiliary disposed in the microchannel.

37. (new) The catalytic system of claim 35 comprising at least 3 arrays of planar microchannels that comprise a tethered catalyst composition or a tethered chiral auxiliary disposed in the microchannel.

38. (new) The catalytic system of claim 34 comprising at least 10 layers of heat exchangers interleaved with at least 10 layers comprising the microchannels that comprise a tethered catalyst composition or a tethered chiral auxiliary disposed in the microchannel.

39. (new) The catalytic system of claim 34 comprising a bridging oxo group connecting a transition metal center of a tethered catalyst with a surface metal or semimetal.

40. (new) The catalytic system of claim 1 comprising $\text{Ni}[\text{P}(\text{OMe})_3]_4$, $\text{RhCl}_3(\text{SR}_2)_3$, $\text{NiCl}_2(\text{PEt}_3)_2$, $\text{RhH}(\text{CO})(\text{PPh}_3)_3$, $\text{RhCl}(\text{CO})(\text{PPh}_3)_2$, or $\text{IrCl}(\text{CO})(\text{PPh}_3)_2$.